OIPE

ENTERED

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/10/043,344   TIME: 11:09:30

Input Set : A:\10043341.APP.txt
Output Set: N:\CRF3\07182002\J043344.raw

```
 3 <110> APPLICANT: Loosmore, Sheena M.
 4        Harkness, Robin E.
 5        Schryvers, Anthony B.
 6        Chong, Pele
 7        Gray-Owen, Scott
 8        Murdin, Andrew D.
 9      . Klein, Michel H.
11 <120> TITLE OF INVENTION: TRANSFERRIN RECEPTOR GENES
13 <130> FILE REFERENCE: 1038-1221 MIS
15 <140> CURRENT APPLICATION NUMBER: 10/043,344
16 <141> CURRENT FILING DATE: 2002-07-01
18 <150> PRIOR APPLICATION NUMBER: 08/649,518
19 <151> PRIOR FILING DATE: 1996-05-17
21 <160> NUMBER OF SEQ ID NOS: 160
23 <170> SOFTWARE: PatentIn Ver. 2.1
25 <210> SEQ ID NO: 1
26 <211> LENGTH: 4699
27 <212> TYPE: DNA
28 <213> ORGANISM: Haemophilus influenzae
30 <220> FEATURE:
31 <221> NAME/KEY: CDS
32 <222> LOCATION: (10)..(1940)
34 <220> FEATURE:
35 <221> NAME/KEY: CDS
36 <222> LOCATION: (1957)..(4696)
38 <400> SEQUENCE: 1
39 tataactca atg aaa tct gta cct ctt atc tct ggt gga ctt tcc ttt tta 51
40            Met Lys Ser Val Pro Leu Ile Ser Gly Gly Leu Ser Phe Leu
41             1               5                   10
43 cta agt gct tgt agc gga ggg ggg tct ttt gat gta gat aac gtc tct   99
44 Leu Ser Ala Cys Ser Gly Gly Gly Ser Phe Asp Val Asp Asn Val Ser
45  15               20                25                30
47 aat acc ccc tct tct aaa cca cgt tat caa gac gat act tca agt tca  147
48 Asn Thr Pro Ser Ser Lys Pro Arg Tyr Gln Asp Asp Thr Ser Ser Ser
49               35                40                45
51 aga aca aaa tct aaa ttg gaa aag ttg tcc att cct tct tta ggg gga  195
52 Arg Thr Lys Ser Lys Leu Glu Lys Leu Ser Ile Pro Ser Leu Gly Gly
53               50                55                60
55 ggg atg aag tta gcg gct ctg aat ctt ttt gat agg aac aaa cct agt  243
56 Gly Met Lys Leu Ala Ala Leu Asn Leu Phe Asp Arg Asn Lys Pro Ser
57            65                70                75
59 ctc tta aat gaa gat agc tat atg ata ttt tcc tca cgt tct acg att  291
60 Leu Leu Asn Glu Asp Ser Tyr Met Ile Phe Ser Ser Arg Ser Thr Ile
```

```
61      80                  85                  90
63 gaa gag gat gtt aaa aat gac aat caa aac ggc gag cac cct att gac  ·339
64 Glu Glu Asp Val Lys Asn Asp Asn Gln Asn Gly Glu His Pro Ile Asp
65  95                 100                 105                 110
67 tca ata gtc gat cct aga gca cca aat tca aac gaa aat cgt cat gga   387
68 Ser Ile Val Asp Pro Arg Ala Pro Asn Ser Asn Glu Asn Arg His Gly
69                 115                 120                 125
71 caa .aaa tat gta tat tca ggg ctt tat tat att caa tcg tgg agt cta   435
72 Gln Lys Tyr Val Tyr Ser Gly Leu Tyr Tyr Ile Gln Ser Trp Ser Leu
73                 130                 135                 140
75 aga gat tta cca aat aaa aag ttt tat tca ggt tac tat gga tat gcg   483
76 Arg Asp Leu Pro Asn Lys Lys Phe Tyr Ser Gly Tyr Tyr Gly Tyr Ala
77             145                 150                 155
79 tat tac ttt ggc aat aca act gcc tct gca tta cct gta ggt ggc gta   531
80 Tyr Tyr Phe Gly Asn Thr Thr Ala Ser Ala Leu Pro Val Gly Gly Val
81      160                 165                 170
83 gca acg tat aaa gga act tgg agc ttc atc acc gca gct gaa aat ggc   579
84 Ala Thr Tyr Lys Gly Thr Trp Ser Phe Ile Thr Ala Ala Glu Asn Gly
85 175                 180                 185                 190
87 aag aat tat gaa ttg tta aga aat tct ggt ggc ggt caa gct tat tct   627
88 Lys Asn Tyr Glu Leu Leu Arg Asn Ser Gly Gly Gly Gln Ala Tyr Ser
89                 195                 200                 205
91 cga cgt agt gct act cca gaa gat att gat tta gat cgt aag acg ggc   675
92 Arg Arg Ser Ala Thr Pro Glu Asp Ile Asp Leu Asp Arg Lys Thr Gly
93             210                 215                 220
95 tta aca agt gaa ttt act gtc aat ttt ggt aca aaa aag ctc act gga   723
96 Leu Thr Ser Glu Phe Thr Val Asn Phe Gly Thr Lys Lys Leu Thr Gly
97      225                 230                 235
99 gga ctt tat tat aat tta cgt gaa aca gat gct aat aaa tca caa aat   771
100 Gly Leu Tyr Tyr Asn Leu Arg Glu Thr Asp Ala Asn Lys Ser Gln Asn
101      240                 245                 250
103 aga aca cat aaa ctc tac gat cta gaa gct gat gtt cat agc aac cga   819
104 Arg Thr His Lys Leu Tyr Asp Leu Glu Ala Asp Val His Ser Asn Arg
105 255                 260                 265                 270
107 ttc agg ggt aaa gta aag cca acc aaa aaa gag tct tct gaa gaa cat   867
108 Phe Arg Gly Lys Val Lys Pro Thr Lys Lys Glu Ser Ser Glu Glu His
109                 275                 280                 285
111 ccc ttt acc agc gag gga aca tta gaa ggt ggt ttt tac ggg cct gag   915
112 Pro Phe Thr Ser Glu Gly Thr Leu Glu Gly Gly Phe Tyr Gly Pro Glu
113             290                 295                 300
115 ggt caa gaa tta gga gga aag ttt tta gct cac gac aaa aaa gtt ttg   963
116 Gly Gln Glu Leu Gly Gly Lys Phe Leu Ala His Asp Lys Lys Val Leu
117     '    305                 310                 315
119 ggg gta ttt agt gcc aaa gaa cag caa gaa acg tca gaa aac aaa aaa   1011
120 Gly Val Phe Ser Ala Lys Glu Gln Gln Glu Thr Ser Glu Asn Lys Lys
121      320                 325                 330
123 tta ccc aaa gaa acc tta att gat ggc aag cta act act ttt aaa aca   1059
124 Leu Pro Lys Glu Thr Leu Ile Asp Gly Lys Leu Thr Thr Phe Lys Thr
125 335                 340                 345                 350
```

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/10/043,344   TIME: 11:09:30

Input Set : A:\10043341.APP.txt
Output Set: N:\CRF3\07182002\J043344.raw

```
127 acc aat gca aca gcc aat gca aca acc gat gca aca acc agt aca aca   1107
128 Thr Asn Ala Thr Ala Asn Ala Thr Thr Asp Ala Thr Thr Ser Thr Thr
129             355             360             365
131 gcc agt aca aaa acc gat aca aca acc aat gca aca gcc aat aca gaa   1155
132 Ala Ser Thr Lys Thr Asp Thr Thr Thr Asn Ala Thr Ala Asn Thr Glu
133             370             375             380
135 aac ttt acg aca aaa gat ata cca agt ttg ggt gaa gct gat tat ctt   1203
136 Asn Phe Thr Thr Lys Asp Ile Pro Ser Leu Gly Glu Ala Asp Tyr Leu
137             385             390             395
139 tta att gat aat tac cct gtt cct ctt ttc cct gag agt ggt gat ttc   1251
140 Leu Ile Asp Asn Tyr Pro Val Pro Leu Phe Pro Glu Ser Gly Asp Phe
141     400             405             410
143 ata agt agt aag cac cat act gta gga aag aaa acc tat caa gta gaa   1299
144 Ile Ser Ser Lys His His Thr Val Gly Lys Lys Thr Tyr Gln Val Glu
145 415             420             425             430
147 gca tgt tgc agt aat cta agc tat gta aaa ttt ggt atg tat tat gaa   1347
148 Ala Cys Cys Ser Asn Leu Ser Tyr Val Lys Phe Gly Met Tyr Tyr Glu
149             435             440             445
151 gcc cca cct aaa gaa gaa gaa aaa gaa aaa gaa aaa gac aaa gac aaa   1395
152 Ala Pro Pro Lys Glu Glu Glu Lys Glu Lys Glu Lys Asp Lys Asp Lys
153             450             455             460
155 gaa aaa gaa aaa caa gcg aca aca tct atc aag act tat tat caa ttc   1443
156 Glu Lys Glu Lys Gln Ala Thr Thr Ser Ile Lys Thr Tyr Tyr Gln Phe
157             465             470             475
159 tta tta ggt ctc cgt act ccc agt tct gaa ata cct aaa gaa gga agt   1491
160 Leu Leu Gly Leu Arg Thr Pro Ser Ser Glu Ile Pro Lys Glu Gly Ser
161     480             485             490
163 gca aaa tat cat ggt aat tgg ttt ggt tat att agt gat ggc gag aca   1539
164 Ala Lys Tyr His Gly Asn Trp Phe Gly Tyr Ile Ser Asp Gly Glu Thr
165 495             500             505             510
167 tct tac tcc gcc agt ggt gat aag gaa cgc agt aaa aat gct gtc gcc   1587
168 Ser Tyr Ser Ala Ser Gly Asp Lys Glu Arg Ser Lys Asn Ala Val Ala
169             515             520             525
171 gag ttt aat gta aat ttt gcc gag aaa aca tta aca ggc gaa tta aaa   1635
172 Glu Phe Asn Val Asn Phe Ala Glu Lys Thr Leu Thr Gly Glu Leu Lys
173             530             535             540
175 cga cac gat act caa aat ccc gta ttt aaa att aat gca acc ttt caa   1683
176 Arg His Asp Thr Gln Asn Pro Val Phe Lys Ile Asn Ala Thr Phe Gln
177             545             550             555
179 agt ggt aag aat gac ttc act ggt aca gca acc gca aaa gat tta gca   1731
180 Ser Gly Lys Asn Asp Phe Thr Gly Thr Ala Thr Ala Lys Asp Leu Ala
181     560             565             570
183 ata gat ggt aaa aat aca caa ggc aca tct aaa gtc aat ttc acg gca   1779
184 Ile Asp Gly Lys Asn Thr Gln Gly Thr Ser Lys Val Asn Phe Thr Ala
185 575             580             585             590
187 aca gta aac ggg gca ttt tat ggt ccg cac gct aca gaa tta ggc ggt   1827
188 Thr Val Asn Gly Ala Phe Tyr Gly Pro His Ala Thr Glu Leu Gly Gly
189             595             600             605
191 tat ttc acc tat aac gga aac aat cct aca gat aaa aat tca tca tcc   1875
```

```
192 Tyr Phe Thr Tyr Asn Gly Asn Asn Pro Thr Asp Lys Asn Ser Ser Ser
193              610              615              620
195 aat tca gaa aag gca aga gct gcc gtt gtg ttt gga gct aaa aaa caa   1923
196 Asn Ser Glu Lys Ala Arg Ala Ala Val Val Phe Gly Ala Lys Lys Gln
197          625              630              635
199 caa gta gaa aca acc aa gtaatggaat actaaa a atg act aaa aaa ccc     1972
200 Gln Val Glu Thr Thr Lys                   Met Thr Lys Lys Pro
201     640                                      645
203 tat ttt cgc cta agt att att tct tgt ctt tta att tca tgc tat gta   2020
204 Tyr Phe Arg Leu Ser Ile Ile Ser Cys Leu Leu Ile Ser Cys Tyr Val
205 650              655              660              665
207 aaa gca gaa act caa agt ata aaa gat aca aaa gaa gct ata tca tct   2068
208 Lys Ala Glu Thr Gln Ser Ile Lys Asp Thr Lys Glu Ala Ile Ser Ser
209              670              675              680
211 gaa gtg gac act caa agt aca gaa gat tca gaa tta gaa act atc tca   2116
212 Glu Val Asp Thr Gln Ser Thr Glu Asp Ser Glu Leu Glu Thr Ile Ser
213              685              690              695
215 gtc act gca gaa aaa gtt aga gat cgt aaa gat aat gaa gta act gga   2164
216 Val Thr Ala Glu Lys Val Arg Asp Arg Lys Asp Asn Glu Val Thr Gly
217          700              705              710
219 ctt ggc aaa att ata aaa act agt gaa agt atc agc cga gaa caa gta   2212
220 Leu Gly Lys Ile Ile Lys Thr Ser Glu Ser Ile Ser Arg Glu Gln Val
221     715              720              725
223 tta aat att cgt gat cta aca cgc tat gat cca ggg att tca gtt gta   2260
224 Leu Asn Ile Arg Asp Leu Thr Arg Tyr Asp Pro Gly Ile Ser Val Val
225 730              735              740              745
227 gaa caa ggt cgc ggt gca agt tct gga tat tct att cgt ggt atg gac   2308
228 Glu Gln Gly Arg Gly Ala Ser Ser Gly Tyr Ser Ile Arg Gly Met Asp
229              750              755              760
231 aga aat aga gtt gct tta tta gta gat ggt tta cct caa acg caa tct   2356
232 Arg Asn Arg Val Ala Leu Leu Val Asp Gly Leu Pro Gln Thr Gln Ser
233              765              770              775
235 tat gta gtg caa agc cct tta gtt gct cgt tca gga tat tct ggc act   2404
236 Tyr Val Val Gln Ser Pro Leu Val Ala Arg Ser Gly Tyr Ser Gly Thr
237          780              785              790
239 ggt gca att aat gaa att gaa tat gaa aat gta aag gcc gtc gaa ata   2452
240 Gly Ala Ile Asn Glu Ile Glu Tyr Glu Asn Val Lys Ala Val Glu Ile
241     795              800              805
243 agc aag ggg ggg agt tct tct gag tat ggt aat gga gca cta gct ggt   2500
244 Ser Lys Gly Gly Ser Ser Ser Glu Tyr Gly Asn Gly Ala Leu Ala Gly
245 810              815              820              825
247 tct gta aca ttt caa agc aaa tca gca gcc gat atc tta gaa gga gac   2548
248 Ser Val Thr Phe Gln Ser Lys Ser Ala Ala Asp Ile Leu Glu Gly Asp
249              830              835              840
251 aaa tca tgg gga att caa act aaa aat gct tat tca agc aaa aat aaa   2596
252 Lys Ser Trp Gly Ile Gln Thr Lys Asn Ala Tyr Ser Ser Lys Asn Lys
253              845              850              855
255 ggc ttt acc cat tct tta gct gta gca gga aaa caa ggt gga ttt gaa   2644
256 Gly Phe Thr His Ser Leu Ala Val Ala Gly Lys Gln Gly Gly Phe Glu
```

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/10/043,344   TIME: 11:09:30

Input Set : A:\10043341.APP.txt
Output Set: N:\CRF3\07182002\J043344.raw

```
257        860                 865                 870
259 ggg gtc gcc att tac act cac cga aat tca att gaa acc caa gtc cat    2692
260 Gly Val Ala Ile Tyr Thr His Arg Asn Ser Ile Glu Thr Gln Val His
261     875                 880                 885
263 aaa gat gca tta aaa ggc gtg caa agt tat gat cga ttc atc gcc aca    2740
264 Lys Asp Ala Leu Lys Gly Val Gln Ser Tyr Asp Arg Phe Ile Ala Thr
265 890                 895                 900                 905
267 aca gag gat caa tct gca tac ttt gtg atg caa gat gag tgt cta gat    2788
268 Thr Glu Asp Gln Ser Ala Tyr Phe Val Met Gln Asp Glu Cys Leu Asp
269                 910                 915                 920
271 ggt tat gac aag tgt aaa act tca ccc aaa cga cct gcg act tta tcc    2836
272 Gly Tyr Asp Lys Cys Lys Thr Ser Pro Lys Arg Pro Ala Thr Leu Ser
273                 925                 930                 935
275 acc caa aga gaa acc gta agc gtt tca gat tat acg ggg gct aac cgt    2884
276 Thr Gln Arg Glu Thr Val Ser Val Ser Asp Tyr Thr Gly Ala Asn Arg
277         940                 945                 950
279 atc aaa cct aat cca atg aaa tat gaa agc cag tct tgg ttt tta aga    2932
280 Ile Lys Pro Asn Pro Met Lys Tyr Glu Ser Gln Ser Trp Phe Leu Arg
281     955                 960                 965
283 gga ggt tat cat ttt tct gaa caa cac tat att ggt ggt att ttt gaa    2980
284 Gly Gly Tyr His Phe Ser Glu Gln His Tyr Ile Gly Gly Ile Phe Glu
285 970                 975                 980                 985
287 ttc aca caa caa aaa ttt gat atc cgt gat atg aca ttt ccc gct tat    3028
288 Phe Thr Gln Gln Lys Phe Asp Ile Arg Asp Met Thr Phe Pro Ala Tyr
289                 990                 995                 1000
291 tta agg cca aca gaa gac aag gat tta caa agt cgc cct ttt tat cca    3076
292 Leu Arg Pro Thr Glu Asp Lys Asp Leu Gln Ser Arg Pro Phe Tyr Pro
293         1005                1010                1015
295 aag caa gat tat ggt gca tat caa cat att ggt gat ggc aga ggc gtt    3124
296 Lys Gln Asp Tyr Gly Ala Tyr Gln His Ile Gly Asp Gly Arg Gly Val
297     1020                1025                1030
299 aaa tat gca agt ggg ctt tat ttc gat gaa cac cat aga aaa cag cgt    3172
300 Lys Tyr Ala Ser Gly Leu Tyr Phe Asp Glu His His Arg Lys Gln Arg
301     1035                1040                1045
303 gta ggt att gaa tat att tac gaa aat aag aac aaa gcg ggc atc att    3220
304 Val Gly Ile Glu Tyr Ile Tyr Glu Asn Lys Asn Lys Ala Gly Ile Ile
305 1050                1055                1060                1065
307 gac aaa gcg gtg tta agt gct aat caa caa aca tca tac ttg aca gtt    3268
308 Asp Lys Ala Val Leu Ser Ala Asn Gln Gln Thr Ser Tyr Leu Thr Val
309                 1070                1075                1080
311 ata tgc gac ata cgc att gca gtc ttt atc cat aat cca agt aag aat    3316
312 Ile Cys Asp Ile Arg Ile Ala Val Phe Ile His Asn Pro Ser Lys Asn
313             1085                1090                1095
315 tgc cgc cca aca ctt gat aaa cct tat tca tac tat cat tct gat aga    3364
316 Cys Arg Pro Thr Leu Asp Lys Pro Tyr Ser Tyr Tyr His Ser Asp Arg
317         1100                1105                1110
319 aat gtt tat aaa gaa aaa cat aac atg ttg caa ttg aat tta gag aaa    3412
320 Asn Val Tyr Lys Glu Lys His Asn Met Leu Gln Leu Asn Leu Glu Lys
321     1115                1120                1125
```

VERIFICATION SUMMARY
PATENT APPLICATION: **US/10/043,344**

DATE: 07/18/2002
TIME: 11:09:31

Input Set : **A:\10043341.APP.txt**
Output Set: **N:\CRF3\07182002\J043344.raw**

L:16 M:271 C: Current Filing Date differs, Replaced Current Filing Date